INTERRELATIONSHIPS WITH OTHER SUB-ELEMENTS

The General Plan of the City of Sunnyvale is composed of seven elements: Transportation, Community Development, Environmental Management, Public Safety, Socio-Economics, Cultural, and Planning and Management. The Air Quality Sub-Element is part of the Environmental Management Element which includes six other sub-elements: Water Resources, Solid Waste Management, Sanitary Sewer system, Energy, Noise, and Surface Runoff

Altogether, there are a total of 24 elements or sub-elements within Sunnyvale's General Plan. The interrelationship of the Air Quality Sub-Element with the goals and policies of those elements or sub-elements that are relevant, is summarized below.

Community Design Sub-Element

The Community Design Sub-element contains the following policy influencing or supporting air quality goals:

Policy B.2: Provide a safe and comfortable system of pedestrian and bicycle pathways.

Land Use Sub-Element

The Land Use Sub-Element contains the following policies influencing or supporting air quality goals:

Policy C.1: A focus for higher intensity uses should occur along existing multi-modal transit corridors or where these used can provide transit capabilities as a condition of development.

Policy C.7: Mixed uses are encouraged in those areas identified as suitable for a high intensity use or as means to provide residential uses adjacent to employment centers.

Housing and Community Revitalization Sub-Element

The Housing and Community Revitalization Sub-Element contains the following policies influencing or supporting air quality goals:

Policy A.1: Continue to improve, if feasible, the existing jobs to housing ratio.

Policy C.2: Continue to require a mix in the price of housing units in new subdivisions and apartment complexes as a way of distributing low and moderate cost housing throughout the City.

Energy Sub-Element

The Energy Sub-Element contains several goals and policies influencing or supporting air quality goals:

GOAL A: Provide for safe and efficient vehicular movement on streets.

Policy A.1: Maintain traffic control devices in good operating conditions.

Policy A.2: Optimize traffic signal system performance.

Policy A.3: Work closely with other jurisdictions responsible for roadways within Sunnyvale to improve traffic flow.

GOAL B: Promote convenient and efficient alternatives to the automobile.

Policy B.1: Support a transit service that provides a convenient and inexpensive alternative to the auto for both Sunnyvale residents and residents of other communities travelling to Sunnyvale.

Policy B.2: Create and maintain a safe and effective system of roadways and bikeways suitable for bicycle use.

Policy B.4: Provide a pleasant and safe environment for pedestrian movement.

Policy B.5: Provide facilities that encourage integrated usage of different modes of transportation.

GOAL C: Increase ridesharing, the use of non-auto travel modes, and off-peak travelling in order to reduce traffic congestion, energy consumption and air pollution.

Transportation Element

The Transportation Element contains several goals and policies influencing or supporting air quality goals:

GOAL A: Provide for safe and efficient vehicular movement.

Policy A.1: Monitor the operation and performance of the street system.

Policy A.3: Maintain traffic control devices in good operating condition.

Policy A.4: Achieve an operation level of service D or better for all arterials, collectors, and intersections during the peak hours.

Policy A.5: Optimize traffic signal system performance.

GOAL B: Promote convenient and efficient alternatives to the automobile.

Policy B.1: Support a transit service that provides a convenient and inexpensive alternative to the auto for both Sunnyvale residents and residents of other communities travelling to Sunnyvale.

Policy B.3: Create and maintain a safe and effective system of roadways and bikeways suitable for bicycle use.

Policy B.4: Assure the provision of adequate bicycle support facilities at all major bicycle usage locations.

Policy B.5: Provide a pleasant and safe environment for pedestrian movement.

Policy B.6: Provide facilities that encourage integrated usage of different modes.

GOAL C: Increase ridesharing, the use of non-auto travel modes, and off-peak travelling in order to reduce traffic congestion, energy consumption and air pollution.

Policy C.1: Work with the County, individual employers, and the Santa Clara County Manufacturing Group to encourage ridesharing and off-peak commuting.

Policy C.2: Promote ridesharing and transit use to the general public.

Policy C.3: Encourage the bicycle as a means of transportation for persons of every age for a variety of purposes.

Socio-Economic Element

The Socio-Economic Element contains the following policy influencing or supporting air quality goals:

Policy B.4: Participate in regional efforts to respond to transportation and housing problems caused by economic growth in order to improve the quality of life and create a better environment for business to flourish.

GOALS, POLICIES AND ACTION STATEMENTS

Introduction

The Air Quality Sub-Element of the City of Sunnyvale's General Plan establishes a set of integrated goals, policies, and action statements which guide decision making and lead toward improved air quality.

This sub-element is one of several sub-elements of the General Plan. The goals and policies of this sub-element affect and can be affected by other sub-elements and thus must be integrated with other sub-elements.

Programs to achieve the goals, policies and action statements of this Sub-Element are currently being developed and implemented by other agencies, including the BAAQMD and the Congestion Management Agency. This Sub-Element formalizes the City's policy to protect the environmental quality of Sunnyvale and the larger Bay Area and its intent to fully participate in implementing these programs. By adopting this Sub-Element, it is not the City's intent to create duplicative, contradictory or more stringent requirements at this time.

In the future, the City will continue to monitor air quality and will respond to changing community conditions or specific situations and new or revised requirements as appropriate. The City will continue its policy of working with and informing businesses of the need for and the content of any proposed future legislative changes and will consider the import of proposed changes on the business community.

Goals, policies, and action statements in this Air Quality Sub-Element are based on sound planning principles and

basic findings of fact previously outlined in this document. These include:

1. Some of the pollutants in the atmosphere in Sunnyvale are generated in upwind cities and transported to the City by the prevailing winds. The City's ability to control such emissions is limited; measures to control these pollutants must be regional in nature.

2. A large portion of the air pollution in Sunnyvale is generated locally and is partially controllable by City policies. The exposure of Sunnyvale's residents to local pollutants such as carbon monoxide, dust, odors and toxic air contaminants is directly a result of the local transportation system and land use patterns.

3. One of the major reasons that air quality continues to be a problem in the Bay Area specifically and California in general, is a relatively high rate of population and economic growth. Major progress has been made in past years in reducing emissions from stationary sources and mobile sources in the Bay Area, with the result that steady improvement in air quality has been documented despite population growth. Under the impetus of the 1990 Clean Air Act Amendments and California Clean Air Act, the state Air Resources Board and BAAQMD have and will be adopting new and more stringent regulations on existing and future industrial sources, implementing more stringent emission standards for vehicles, developing and implementing Transportation Control Measures (TCMs) to reduce vehicular emissions, and adding new sources to the list of controlled processes (e.g., consumer products, fireplaces and wood stoves, etc.). These measures, if implemented expeditiously, should continue the overall

improvement in air quality evident over the past 20 years.

4. The major obstacle to improved air quality in the future is increasing population and vehicle use and deteriorating operating conditions on highways and roads. The extent that future growth affects air quality will be partially determined by the form that new land uses take, and the transportation and housing options available to new residents.

5. Sunnyvale is within the nine-county Bay Area Air Quality Management District and within the Bay Area Air Basin. This air basin has been identified as not meeting all State and Federal air quality standards. Since Sunnyvale contributes to the emissions burden of the region, Sunnyvale should make a contribution towards reducing overall emissions within the air basin.

Goals

Air Quality goals are organized under three headings:

A. Air Quality and Exposure (GOAL A)
B. Future Development (GOAL B)
C. Regional Air Quality (GOAL C)

GOAL A: IMPROVE SUNNYVALE'S AIR QUALITY AND REDUCE THE EXPOSURE OF ITS CITIZENS TO AIR POLLUTANTS

POLICY A.1: Require all new development to utilize site planning to protect citizens from unnecessary exposure to air pollutants.

Action Statements:

A.1.a. Evaluate new development with potential sources of odors or criteria air pollutants to determine whether it is appropriate for them to be located near existing or planned residential development or sensitive receptors.

A.1.b. New residential zones or residential development in non-residential zones should not be permitted near existing sources of TAC's, unless it can be shown through a Health Risk Assessment that no unacceptable health risk is created.

A.1.c. New residential development should be located at least 15 feet from the property line along major streets or intersections unless a lesser distance can be demonstrated to not expose residents to unhealthful pollutant concentrations.

POLICY A.2: Reduce automobile emissions through traffic and transportation improvements. Since traffic congestion delays increase the level of emissions, congestion management has air quality benefits.

Action Statements:

A.2.a. Develop and maintain a balanced transportation system in Sunnyvale by promoting pedestrian, bicycle and transit modes of travel.

A.2.b. The City should give high priority to traffic improvements that improve vehicle operating conditions (average speed, delay) such as signal timing improvements, signal synchronization, turn lanes, etc. BAAQMD guidance developed for the CMP program deficiency plans defines such improvements.

GOAL B: REDUCE AIR POLLUTION IMPACTS FROM FUTURE DEVELOPMENT

POLICY B.1: Utilize land use strategies to reduce air quality impact.

Action Statements:

B.1.a. Promote extension of transit systems, and locate higher density development/redevelopment along transit corridors.

B.1.b. Promote mixed land use development that provides commercial services such as day care, restaurants, banks and stores near employment centers, reducing auto trip generation by promoting pedestrian travel. Promote neighborhood commercial and park uses within residential developments to reduce short auto trip generation by making pedestrian and bicycle

trips feasible (for example, require sidewalks, bike trails and bicycle parking areas).

POLICY B.2: Assist employers in meeting requirements of Transportation Demand Management (TDM) plans for existing and future large employers and participate in the development of TDM plans for employment centers in Sunnyvale.

Action Statements:

B.2.a. Enforce the provisions of the City's TDM ordinance covering businesses employing 100 or more persons.

B.2.b. Amend the City's existing TDM ordinance to comply with the BAAQMD's Trip Reduction Rule.

B.2.c. At the appropriate time, the City should explore the feasibility of seeking delegation of regulations which would affect smaller employers located within multi-tenant complexes, which are not included in the Trip Reduction Rule authority from the Bay Area Air Quality Management District.

POLICY B.3: Apply the Indirect Source Rule[12] to new development with significant air quality impacts. Indirect Source review would cover commercial and residential projects as well as other land uses that produce or attract motor vehicle traffic.

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[12] The Bay Area '91 Clean Air Plan contains as a Transportation Control Measure the development of a rule to reduce vehicle trips to airports, arenas, universities, residential developments, shopping centers and other indirect sources. The current intent is that the BAAQMD would delegate this authority to local agencies if certain criteria are met--one being the adoption of an adequate Air Quality Element.

Action Statements:

B.3.a. Increase densities near transit stations.

B.3.b. Develop requirements for bicycle and pedestrian facilities.

B.3.c. Require site design to encourage transit circulation and stops/waiting areas for transit and carpools.

B.3.d. Consider controls to decrease vehicle idling emissions caused by "drive-through" operations.

GOAL C: MAKE A CONTRIBUTION TOWARDS IMPROVING REGIONAL AIR QUALITY

POLICY C.1: The City should actively participate in regional air quality planning.

Action Statements:

C.1.a. The City should work with regional air quality planning agencies such as the Bay Area Air Quality Management District, **Metropolitan Transportation Commission**, **Association of Bay Area Governments**, and Congestion Management Agency in the development and implementation of regional air quality strategies.

C.1.b. Continue to monitor federal and state legislation regarding air quality issues.

POLICY C.2: Improve opportunities for citizens to live and work in close proximity.

Action Statements:

C.2.a. In the long term, the City should encourage a better balance between jobs and housing than currently exists in Sunnyvale to reduce long distance commuting.

C.2.b. The City should encourage affordable housing.

POLICY C.3: Contribute to a reduction in Regional Vehicle Miles Travelled.

Action Statements:

C.3.a. The City should support and actively promote the expansion and improvement of local and regional transit systems providing service to Sunnyvale.

C.3.b. The City should be a leader in implementing the Transportation Control Measures (TCM's) that are included in the Bay Area '91 Clean Air Plan, the regional plan required under the California Clean Air Act. The Plan currently includes 23 TCMs. Of these the following identify cities as an implementing agency:

TCM 1: Expand Employer Assistance Programs
TCM 2: Adopt Employer-Based Trip Reduction Rule
TCM 9: Improve Bicycle Access and Facilities
TCM 12: Improve Arterial Traffic Management
TCM 13: Transit Use Incentives
TCM 15: Provide Carpool Incentives
TCM 16: Indirect Source Control Program

TCM 18: Zoning for Higher Densities near Transit Stations

TCM 19: Air Quality Elements for General Plans

POLICY C.4: Reduce Emissions from City of Sunnyvale fleet vehicles

Action Statements:

C.4.a. As a large employer, the City will provide leadership in the implementation of air quality programs such as the Trip Reduction Ordinance.

C.4.b. The City will evaluate the development and implementation of a program to introduce and expand the use of alternative, cleaner fuels in its fleet of vehicles.

APPENDIX A

GLOSSARY

APPENDIX A

GLOSSARY

Air Quality Standard: The specified average concentration of an air pollutant in ambient air during a specified time period at or above which undesirable effects may be produced. Both national and state standards exist; in general the state standards are the more stringent.

Association of Bay Area Governments (ABAG): A voluntary association of counties and cities (otherwise known as a Council of Governments) this is the land-use planning agency for the nine-county San Francisco Bay Area.

Bay Area Air Quality Management District (BAAQMD): A nine-county regional district with permit authority over all stationary sources of air pollutants. The District maintains inventories of air pollution sources and monitors air quality with a network of monitoring stations. Under the California Clean Air Act, the BAAQMD is responsible for the preparation of the regional Clean Air Plan.

California Clean Air Act: A law setting forth a comprehensive program to ensure that all areas within the State of California will attain federal and state ambient air quality standards by the earliest practicable date. Also known as the Sher Bill or AB-2595, the law mandates comprehensive planning and implementation efforts, and empowers local air pollution control districts to adopt transportation control measures and indirect source control measures to achieve and maintain the ambient air quality standards.

CALINE-4 Model: A model developed by the California Department of Transportation which calculates ambient concentrations of carbon monoxide from vehicular traffic on a roadway segment, intersection, or parking lot.

Congestion Management Agency: A county-wide organization responsible for preparing and implementing the county's CMP. CMA's came into existence as a result of state legislation and the voters' approval of Proposition 111 in 1990.

Congestion Management Program (CMP): A state mandated program that requires each county to prepare a plan to relieve congestion and air pollution.

Criteria Pollutants: Air pollutants for which the federal or state governments have established ambient air quality standards, or criteria, for outdoor concentration in order to protect public health.

Indirect Source: A development, facility, building, structure, installation or highway improvement that attracts mobiles sources of air pollutants (vehicles). Examples of indirect sources are major highways and airports, shopping centers, sport complexes, recreational facilities and major parking facilities.

Inversion: A condition of the atmosphere in which temperature increases or remains constant with altitude. Such conditions greatly reduce vertical mixing of the atmosphere.

Metropolitan Transportation Commission (MTC): The transportation planning and financing agency for the nine-county San Francisco Bay Area.

Nonattainment Area: Both the State and Federal Clean Air Acts require the California Air Resources Board to designate all air basins within California as attainment, nonattainment or unclassified with respect to the State and National ambient air quality standards. The nonattainment designation indicates that, based on available air quality data, that the standard is currently not being met in the air basin.

Ozone Precursors: Primary pollutants involved in the photochemical production of ozone in the urban atmosphere, hydrocarbons (also known as Reactive Organic Gases) and oxides of nitrogen.

Photochemical Smog: A general term used to describe dense, visible air pollution. While the term smog is often applied to any visible pollution, photochemical smog is a summertime, warm weather phenomena resulting from the reaction of different pollutants in the atmosphere in sunlight to create a brownish, irritating haze.

Point Source: A sizeable stationary emission source at a specific location, such as a factory, refinery or power plant.

Pollution Potential: The relative ability of the atmosphere to transport or dilute pollutants. Determined by physiographic and climatic factors alone, it can be considered quantitatively as the concentration resulting from a unit amount of pollution emitted.

Sensitive Receptors: Sensitive populations such as children, athletes, elderly and the sick that are more susceptible to the effects of air pollution than the population at large.

Toxic Air Contaminants: Air pollutants that are carcinogens or produce acute effects. Toxic air pollution thresholds are based on a quantitative risk assessment rather than ambient air quality standards as with criteria pollutants.

APPENDIX B

CALINE-4 MODEL AND ASSUMPTIONS

APPENDIX B

CALINE-4 MODEL AND ASSUMPTIONS

The CALINE-4 model is a fourth-generation line source air quality model that is based on the Gaussian diffusion equation and employs a mixing zone concept to characterize pollutant dispersion over the roadway.[1] Given source strength, meteorology, site geometry and site characteristics, the model predicts pollutant concentrations for receptors located within 150 meters of the roadway. The CALINE-4 model allows roadways to be broken into multiple links that can vary in traffic volume, emission rates, height, width, etc.

The intersection mode of the model was employed, which distributes emissions along each leg of the intersection for free-flow traffic, idling traffic and accelerating and decelerating traffic. The intersection model extended 250 meters in all directions. Receptors (locations where the model calculates concentrations) were located at distance of 10 meters from the roadway edge for all four corners of the intersection.

The worst case mode of the CALINE-4 model was employed. In this mode the wind direction is varied to determine which wind direction results in the highest concentration for each receptor. Emission factors were derived from the California Air Resources Board EMFAC-7EP model. Adjustments were made for vehicle mix and hot start/cold start/ hot stabilized percentages appropriate to each roadway. Temperature was assumed to be 40 degrees F.

The computation of carbon monoxide levels assumed the following worst-case meteorological conditions:

Windspeed: 1 mps
Stability: F Category
Mixing Height: 1000 meters
Surface Roughness: 100 cm
Standard Deviation of Wind Direction: 10 degrees
The CALINE-4 model calculates the local contribution of nearby roads to the total concentration. The other contribution is the background level attributed to more distant traffic. The background levels assumed for 1992 were 10.6 and 6.2 PPM for the 1-hour and 8-hour averaging times, respectively. The background levels for 2010 were taken as 7.9 and 4.4 PPM for the 1-hour and 8-hour averaging times, respectively. These background values were derived from published sources.[2]

To generate estimates of 8-hour concentrations from the 1-hour CALINE results a persistence factor of 0.7 was employed.

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[1] California Department of Transportation, CALINE-4- A Dispersion Model for Predicting Air Pollutant Concentrations Near Roadways, Report No. FHWA/CA/TL-84-15, 1984.

[2] Bay Area Air Quality Management District, Air Quality and Urban Development, November 1985. (Revised April, 1991)

APPENDIX C

URBEMIS-3 PROGRAM AND ASSUMPTIONS

APPENDIX C

URBEMIS-3 PROGRAM AND ASSUMPTIONS

Estimates of regional emissions generated by project traffic were made using a program called URBEMIS-3. URBEMIS-3 is a program that estimates the emissions that would result from various land use development projects. A land use project can include residential uses such as single-family dwelling units, apartments and condominiums, and nonresidential uses such as shopping centers, office buildings, and industrial parks. URBEMIS-3 contains default values for much of the information needed to calculate emissions. However, project-specific, user-supplied information can also be used when it is available.

The following is a description of the parameters that were used in the regional air quality analysis of the proposed project:

-Ambient Temperature: 60 degrees F.

-Trip Lengths:

Home Based Work	7.48 miles
Home Based Shop	4.06 miles
Home Based Other	5.79 miles
Work Based Work	11.12 miles
Work Based Non-Work	5.18 miles

-Year of Analysis: 2010

-Average Speed: 30 miles per hour

Trip lengths were taken from Metropolitan Transportation Commission travel statistics for Sunnyvale.[1]

[1] Metropolitan Transportation Commission, Bay Area Travel Forecasts, Congestion Management Program Databook #1: Regional Summary, March 1991.

RESOLUTION

RESOLUTION NO. 166-93

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF SUNNYVALE AMENDING THE GENERAL PLAN BY ADDING THERETO AN AIR QUALITY SUBELEMENT

WHEREAS, the Department of Community Development has proposed an amendment to the 1972 General Plan of the City of Sunnyvale, as amended, to add the Air Quality Subelement thereto, which proposed Subelement is set forth in Report to Council No. 93-354 dated July 13, 1993; and

WHEREAS, this project was determined to be categorically exempt from the requirements of the California Environmental Quality Act of 1970, as amended, and City Council Resolution No. 193-86; and

WHEREAS, the Planning Commission held a noticed public hearing on the proposed amendments on May 24, 1993, after which the Planning Commission recommended that the City Council adopt the amendment; and

WHEREAS, the City Council held a noticed public hearing to consider adoption of the amendment on July 13, 1993, at which time certain amendments to the Subelement were approved;

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF SUNNYVALE THAT:

1. The City Council finds and determines that the proposed amendment conforms with the requirements provided for in the Sunnyvale Municipal Code, that it is a suitable and logical change of the General Plan for the development of the City of Sunnyvale, and that it is in the public interest.

2. The Air Quality Subelement as adopted, a copy of which is

on file in the Office of the City Clerk of the City of Sunnyvale, is hereby added to the 1972 General Plan of the City of Sunnyvale. The above-described Subelement, incorporating amendments approved at the time of adoption, is hereby incorporated by this reference.

3. The Mayor and City Clerk are directed to endorse the amendment to the 1972 General Plan of the City of Sunnyvale and to show that the same has been adopted by the City Council.

4. The City Clerk is directed to file a certified copy of the amendment to the 1972 General Plan of the City of Sunnyvale with the Board of Supervisors and the Planning Commission of the County of Santa Clara and the planning agency of each city within the County of Santa Clara. The City Clerk is directed further to file a certified copy of the amendment with the legislative body of each city, the land of which may be included in the plan.

Adopted by the City Council at a regular meeting held on July 13, 1993, by the following vote:

AYES: KAWCZYNSKI, WALDMAN, STONE, PARKER, ROWE, CASTILLO
NOES: NONE
ABSENT: NONE
ABSTAIN: NAPIER

APPROVED:

Patricia L Castillo
Mayor

ATTEST:
City Clerk

By Carol Ann Sutter
Deputy City Clerk
(SEAL)